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Colonial Waterbird Populations and Management on Florida's Gulf of Mexico Coast

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Colonial Waterbird Populations and Management on Florida's Gulf of Mexico Coast



2011 Bird Strike North America Conference
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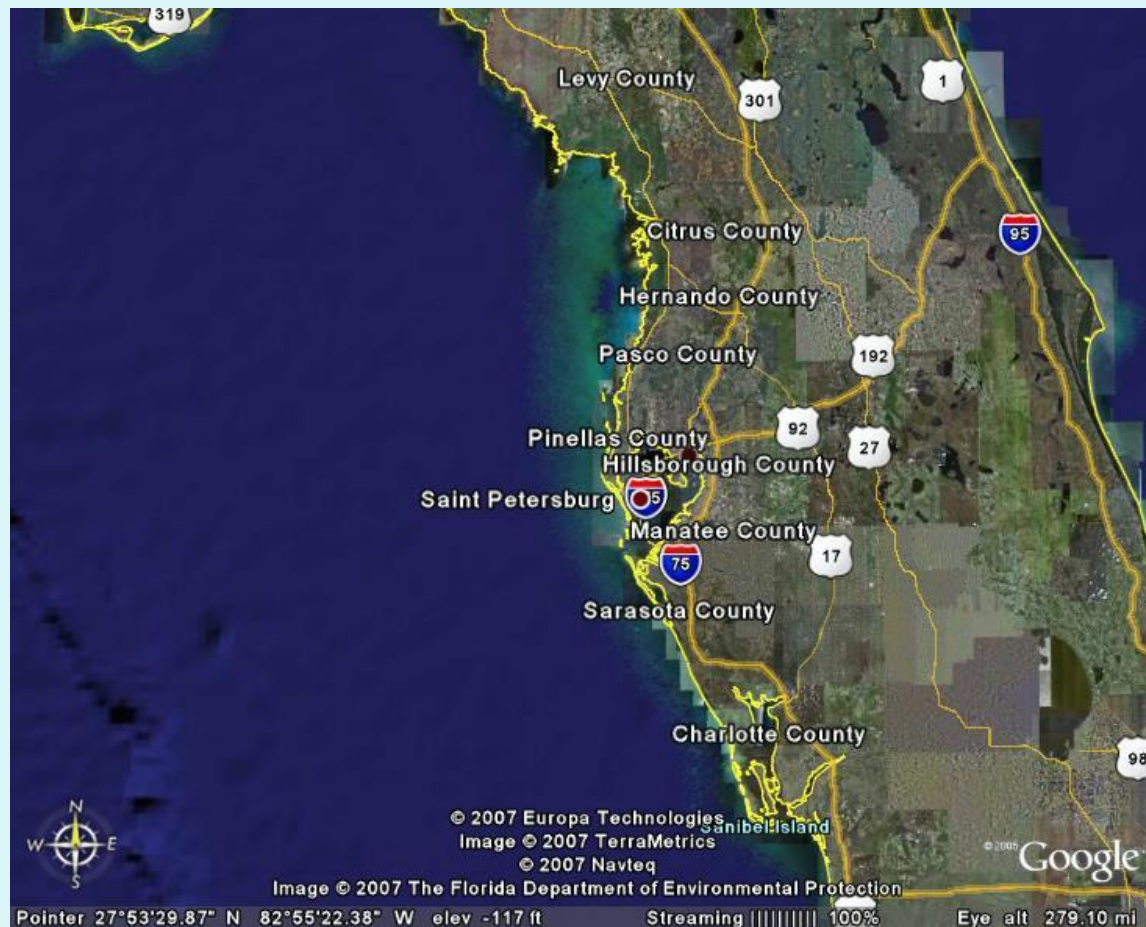
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Sanctuaries Program, Audubon of Florida, Tampa, Florida, USA**



Audubon OF FLORIDA

Study Area - Florida's Gulf of Mexico Coast – ~200 miles Levy County to Charlotte County & N. Lee County



Waterbirds - definitions

Waterbirds include long-legged wading birds, seabirds (gulls and terns), and shorebirds

Colonial nesters – nest in colonies for behavioral synchrony and mutual defense

- tree nesting – wading birds

- beach nesting – gulls, terns, black skimmers

Solitary beach nesters – nest singly, generally on shorelines
(American oystercatchers, willet, plovers)

Audubon's Florida Coastal Islands Sanctuaries

Colonial Waterbird Management Program

- 75 year old conservation program
- Annual management of 30 species of colonial waterbirds & seabirds nesting on Florida's Gulf of Mexico coast
- Approximately >200,000 birds / 100,000 pairs annually, the highest richness of these species in Florida
- Nesting colony protection is critical for successful reproduction
- Post, monitor, survey, manage, & patrol 125 local colonies & coordinate with colony management agencies & volunteers

Audubon's Florida Coastal Islands Sanctuaries Colonial Waterbird Management Program

- Annual Program Activities
 - Nesting protection: spring & summer nesting season - Posting, planning, coordination
 - Comprehensive colony protection & project management, habitat restoration projects – throughout year
 - Conservation and policy initiatives – throughout year
 - Survey data allow tracking population trends



Brief history of the colony survey program

- Management program since 1930s, focused on a few colonies
- Sporadic surveys before 1980s
- No coherent regional survey
- First comprehensive survey in Tampa Bay 1984-1985
- Found 22 active bird colonies – at least 11 of which have winked out because they were disrupted or abandoned
- ~59,000 pairs on 5 colonies that no longer support large populations:
 - Fantasy Island 15,000
 - Port Manatee Key 4,000
 - Bayway Spoil 30,000
 - Tarpon Key 2,000
 - Passage Key 7,500
- Birds moved to other colony locations
- Survey area increased in 1990s, found more colonies and added them to the survey schedule
- Widened survey area to more counties, higher level of effort, more partners

Program emphasis on colonial waterbirds –
messengers for conservation, indicators of ecological integrity,
charismatic wildlife of Florida



Listing Status

USFWS and FWC Listed Species

- Brown Pelican -- SSC
- Snowy Egret -- SSC
- Little Blue Heron -- SSC
- Tricolored Heron -- SSC
- Reddish Egret -- SSC
- White Ibis -- SSC
- Roseate Spoonbill -- SSC
- Wood Stork -- E
- Florida Sandhill Crane -- T
- Whooping Crane -- E (Experimental)
- Limpkin -- SSC
- Least Tern - T
- Bald Eagle -- T
- Snail Kite -- E
- Marian's Marsh Wren -- SSC
- Worthington's Marsh Wren - SSC

Top 20 Common Birds In Decline (Florida)

- **American Bittern ↓59%**
- **Little Blue Heron ↓54%**

Watch List Species –

RED LIST and YELLOW LIST

- **Reddish Egret**

Watch List Species

(Partners In Flight & National Audubon Society)

YELLOW LIST

- ❖ Snowy Plover
- ❖ **Wilson's Plover**
- ❖ Long-billed Curlew
- ❖ Marbled Godwit
- ❖ Red Knot
- ❖ Sanderling
- ❖ Semipalmated Sandpiper
- ❖ Gull-billed Tern
- ❖ Roseate Tern
- ❖ Black Skimmer
- ❖ Mangrove Cuckoo
- ❖ Red-headed Woodpecker
- ❖ Prairie Warbler
- ❖ Warbler Migrants
- ❖ Prothonotary Warbler
- ❖ Painted Bunting
- ❖ **Clapper Rail**
- ❖ Western Sandpiper
- ❖ Nelson's Sharp-tailed Sparrow

- ❖ Northern Bobwhite
- ❖ Horned Grebe
- ❖ **Little Blue Heron**
- ❖ Northern Harrier
- ❖ Peregrine Falcon
- ❖ **Limpkin**
- ❖ American Oystercatcher
- ❖ American Avocet
- ❖ Lesser Yellowlegs
- ❖ Whimbrel
- ❖ Dunlin
- ❖ Short-billed Dowitcher
- ❖ Wilson's Snipe
- ❖ Common Tern
- ❖ Burrowing Owl
- ❖ Chuck-will's Widow
- ❖ Whip-poor-will
- ❖ Loggerhead Shrike
- ❖ Brown-headed Nuthatch
- ❖ Grasshopper Sparrow

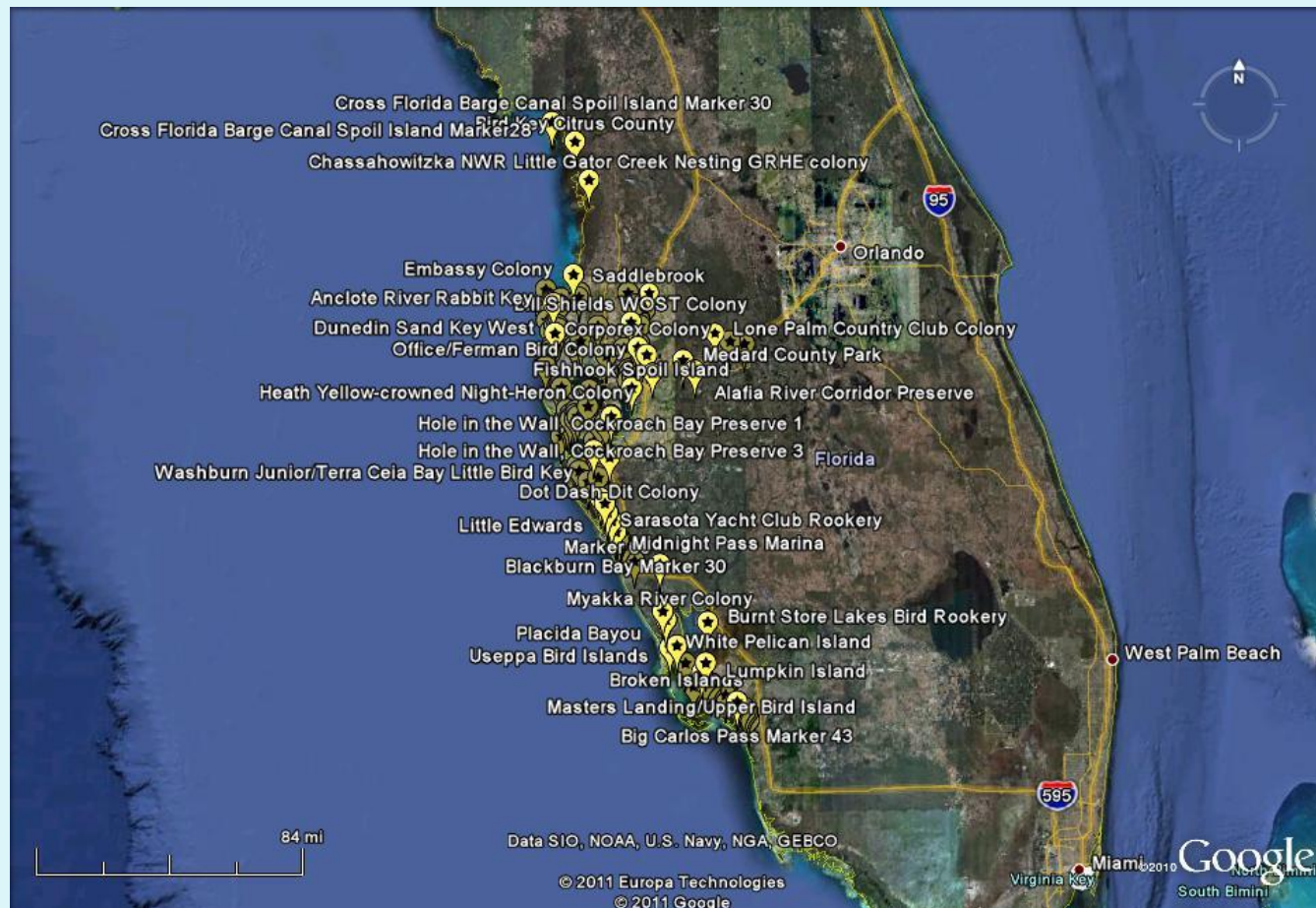
Watch List Species

(Partners In Flight & National Audubon Society)

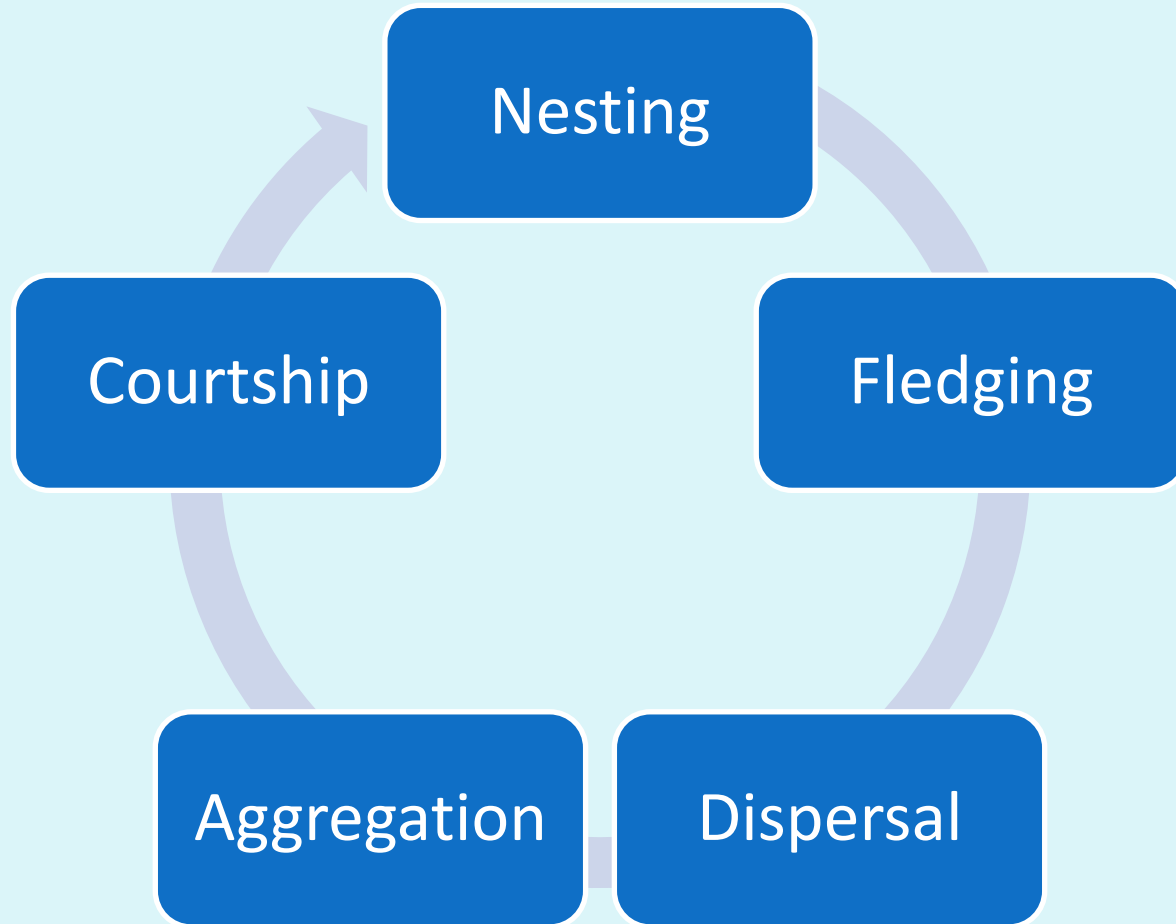
RED LIST

- ❖ **Mottled Duck**
- ❖ Magnificent Frigatebird
- ❖ Reddish Egret
- ❖ **Black Rail**
- ❖ Whooping Crane
- ❖ Piping Plover
- ❖ **Least Tern**
- ❖ Ivory-billed
Woodpecker*
- ❖ Florida Scrub-Jay

2011 - Colonial wadingbird and seabird colonies – 10 county area – 125+ active colonies annually



Waterbird seasonal activity cycle



Nomadism vs. migration



- Regional waterbird populations are not migratory; instead, they are nomadic – centered on nesting colonies during the nesting season, and searching for forage the rest of the year
- Least terns, most shorebirds – migrate annually
- White pelicans – breeding adults migrate, non-breeding young birds may over-winter

What do waterbirds need to complete the cycle?

- **Food** – the right forage –
aquatic and terrestrial macro-invertebrates
(larvae & adults)
 - & **SMALL** fish
- **Water** – quantity and quality; young
may need or benefit from freshwater,
even though adults are estuarine
nesters
- **Cover** – for nesting, hiding,
& foraging
- **Space** –
 - Home range – generally not
defended by waders
 - Territory – defended nest site



And, for successful nesting – birds need no disturbance,
no predators



Food

➤ ***Each species requires the right forage –***

Need foraging opportunities optimal for foraging strategy (visual or tactile feeders) and for leg length

Forage is generally aquatic and terrestrial macro-invertebrates (larvae & adults) & SMALL fish



Foraging Strategies

Several species may forage at the same time, & partition prey



Age groups may partition prey based on foraging adeptness



Foraging strategies vary among species

By target prey and by behavior



By day and by night



Young birds take time to develop foraging abilities

Limpkin adult can forage in much deeper water than chicks

Limpkin adult forages for snails and large invertebrates, the chick is fed tiny invertebrate prey



Young need very shallow littoral zones

Forage availability varies seasonally and with water elevation

Extended littoral zone with mixed graminoids, forbs, shrubs – diverse structure for species with different foraging strategies

Stormwater ponds with dense seed and terrestrial and aquatic invertebrate production



Water

- Species nest in the estuary and the adults tolerate estuarine or marine salinities
- Nestlings of white ibis must be fed freshwater prey
- Young of other species eat both estuarine and freshwater prey



Cover

Provides

- Nesting sites

- Hiding cover

- Foraging opportunity

- Variable by species

Reduces energy needs – birds are not flushed continuously



Space

➤ **Home range**

- Wading birds in west-central Florida are generally not migratory
- Nomadic during the non-nesting period, focused on the nesting colony during the nesting period

➤ **Territory**

- The nest and area defended around the nest – size varies for each species



Airports

Summary of airports by type in the 10 county area of west-central peninsular Florida.

7 categories, 29 airports

29 Airports in 10 counties - west-central Florida

	Pr. Comm.	Non-Pr. Comm.	Reliever	GA	Other Public	Military	Private Use	Total
Citrus				1				1
Hernando				2	2			4
Pasco					1		1	2
Pinellas	1		2					3
Hillsborough	1		2	1		1		5
Polk			1	2	1		1	5
Manatee					1			1
Sarasota	1							1
Charlotte	1		2		1		1	5
Lee	1	1						2

Primary Commercial Service

Hillsborough County

Tampa International Airport

Pinellas County

St. Petersburg – Clearwater
International Airport

Sarasota County

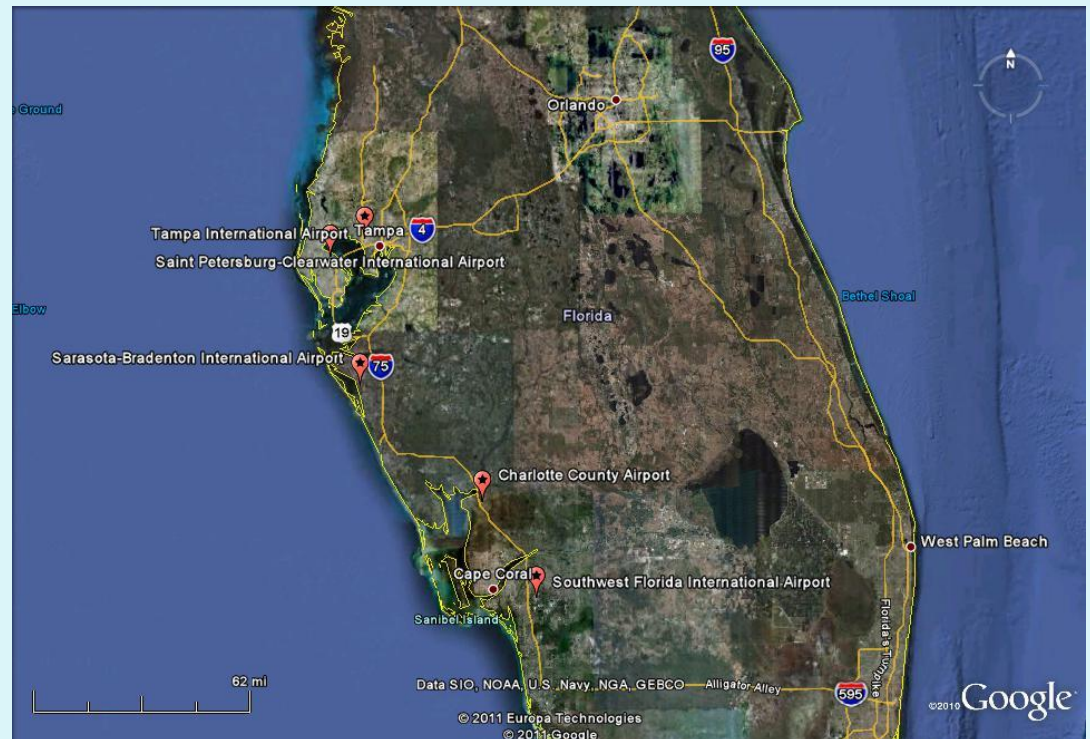
Sarasota-Bradenton International
Airport

Charlotte County

Charlotte County Airport – Punta
Gorda

Lee County

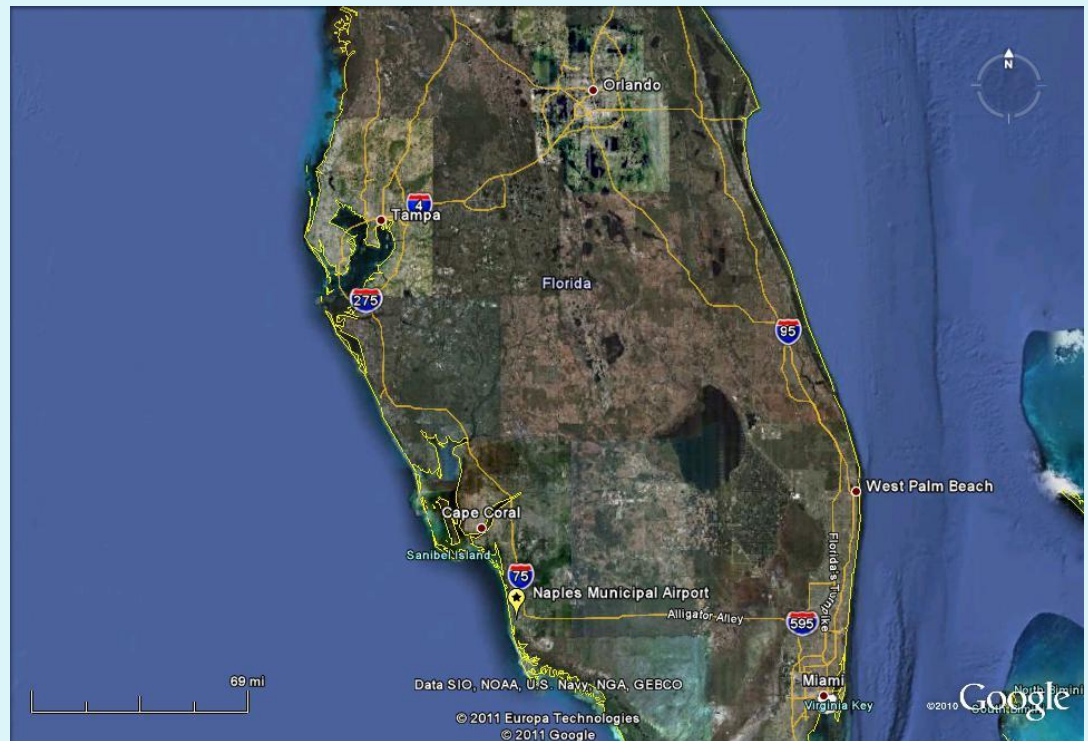
Southwest Florida International
Airport – Ft. Myers



Non-Primary Commercial Service

Lee County

Naples Municipal Airport



Reliever Airports

Hillsborough County

Peter O. Knight Airport

Tampa Executive Airport (Vandenberg
Airport)

Polk County

Lakeland Linder Regional Field –
Lakeland

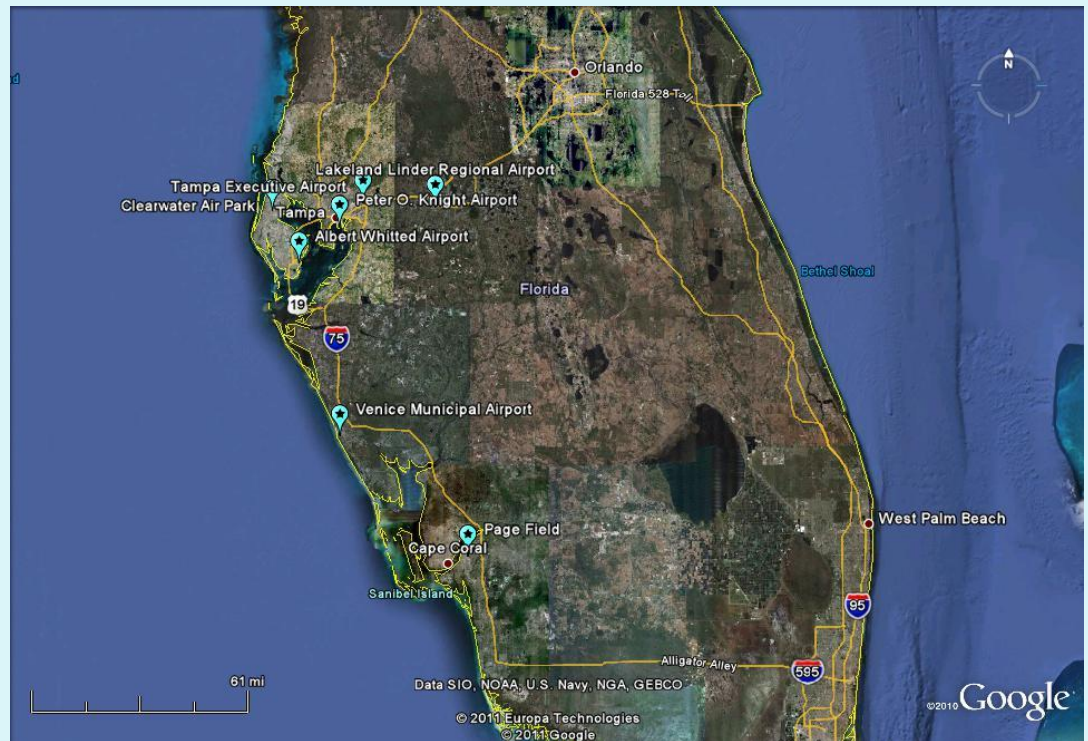
Pinellas County

Clearwater Air Park – Clearwater
Albert Whitted – St. Petersburg

Charlotte County

Page Field – Ft. Myers

Venice Municipal Airport - Venice



General Aviation Airports

Citrus

Inverness Airport – Inverness

Hernando County

Hernando County Airport – Brooksville

Winter Haven's Gilbert Airport – Winter Haven

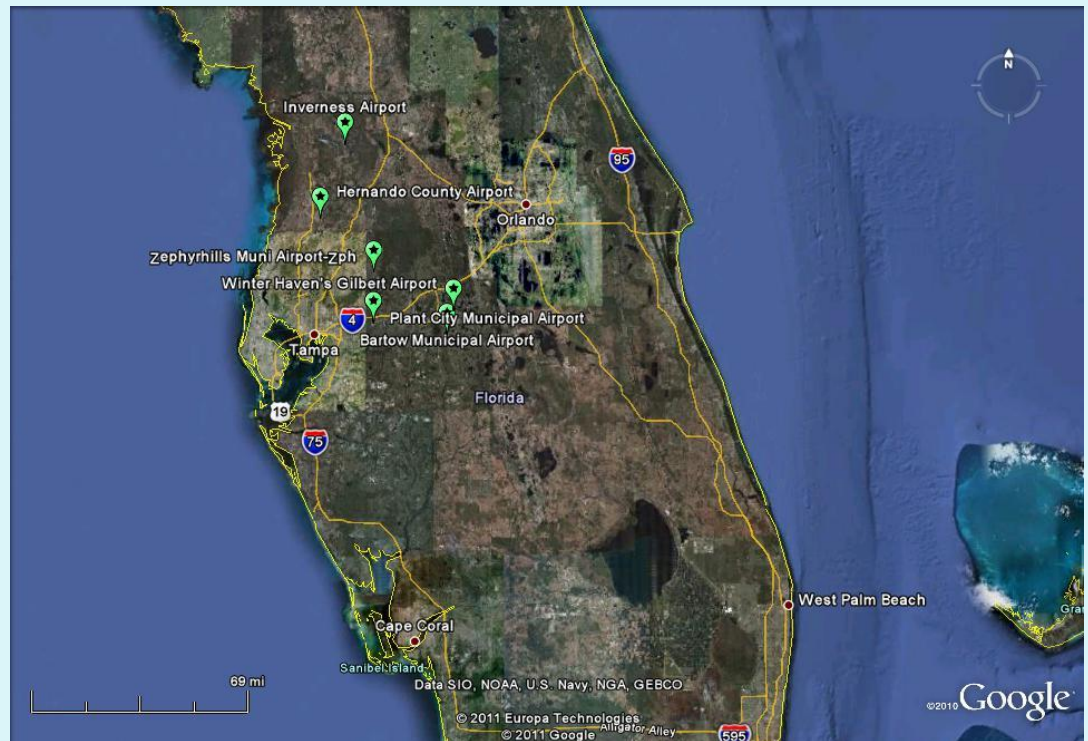
Polk County

Bartow Municipal Airport – Bartow

Hillsborough County

Zephyrhills Municipal Airport – Zephyrhills

Plant City Airport – Plant City



Other Public Use Airports (not NPIAS listed)

Hernando County

Pilot Country Airport –
Brooksville/Spring Hill

Jack Brown's Seaplane Base – Winter
Haven

Polk County

South Lakeland Airport - Lakeland

Pasco County

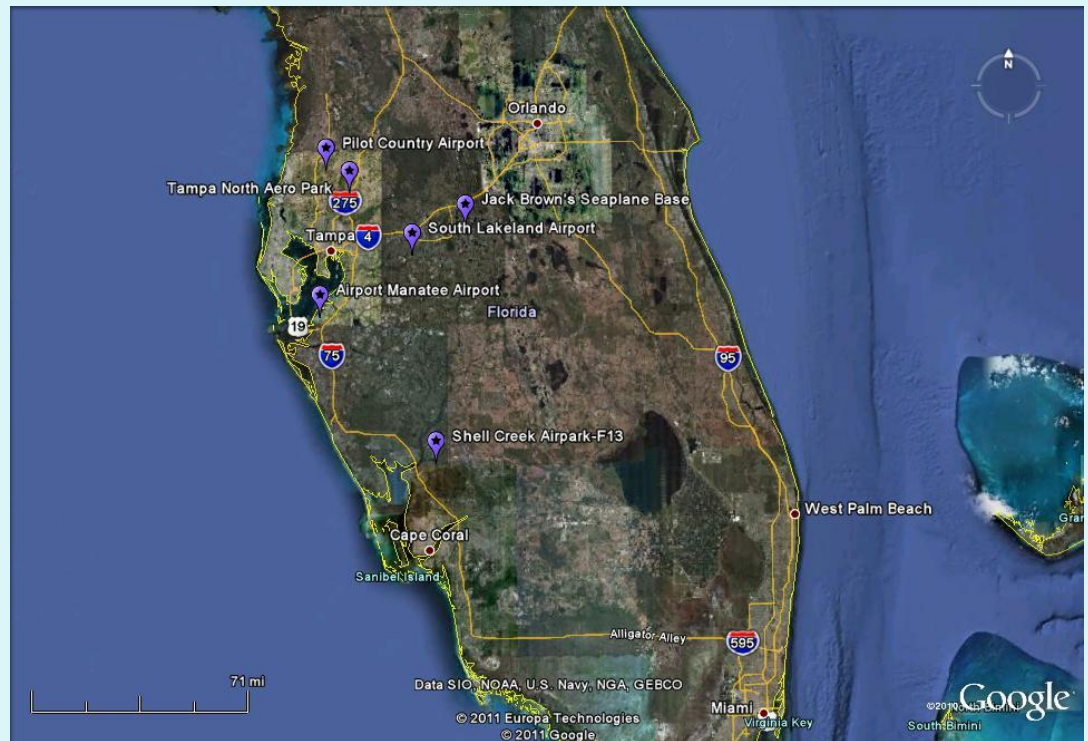
North Tampa Aero Park – Wesley Chapel

Manatee County

Airport Manatee – Palmetto

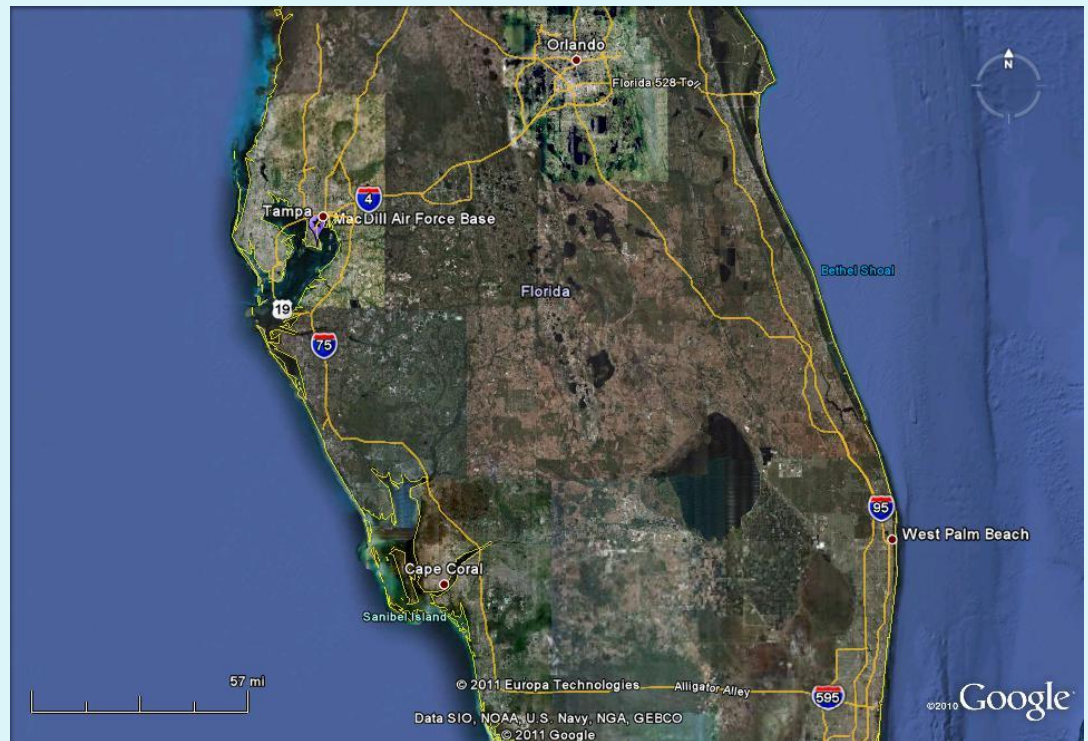
Charlotte County

Shell Creek Airpark – Punta Gorda



Military Airports

Hillsborough County
MacDill Air Force Base



Notable Private-use Airports

Pasco County

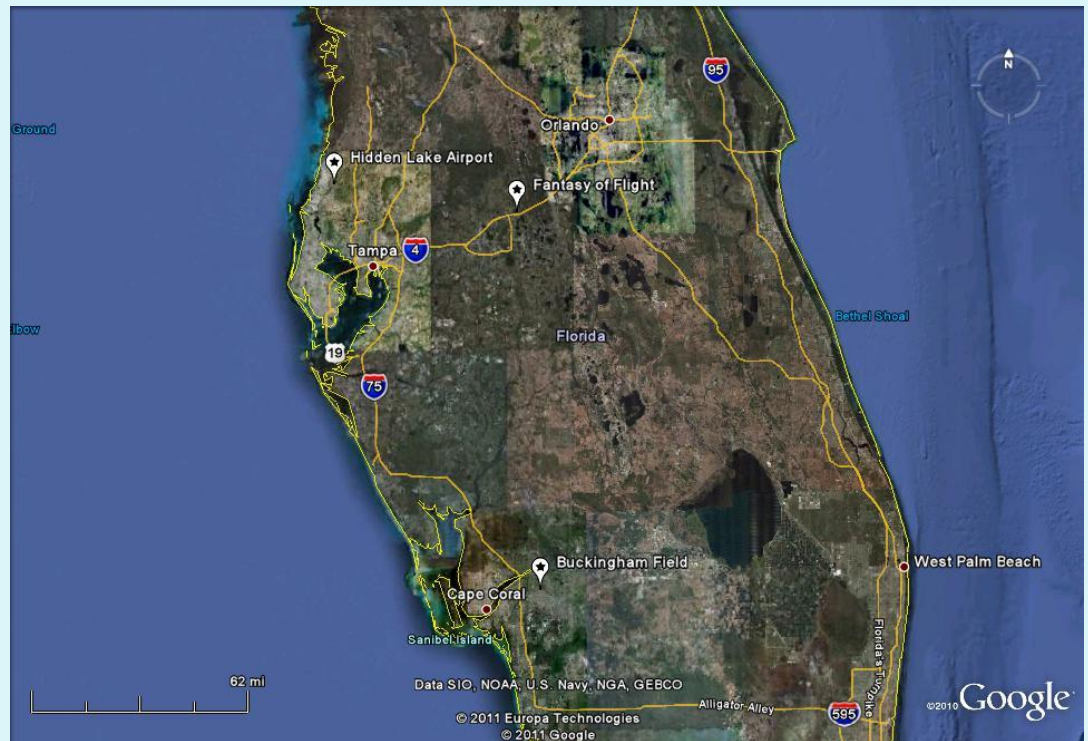
Hidden Lake Airport (Hidden Lake Estates) – New Port Richey

Polk County

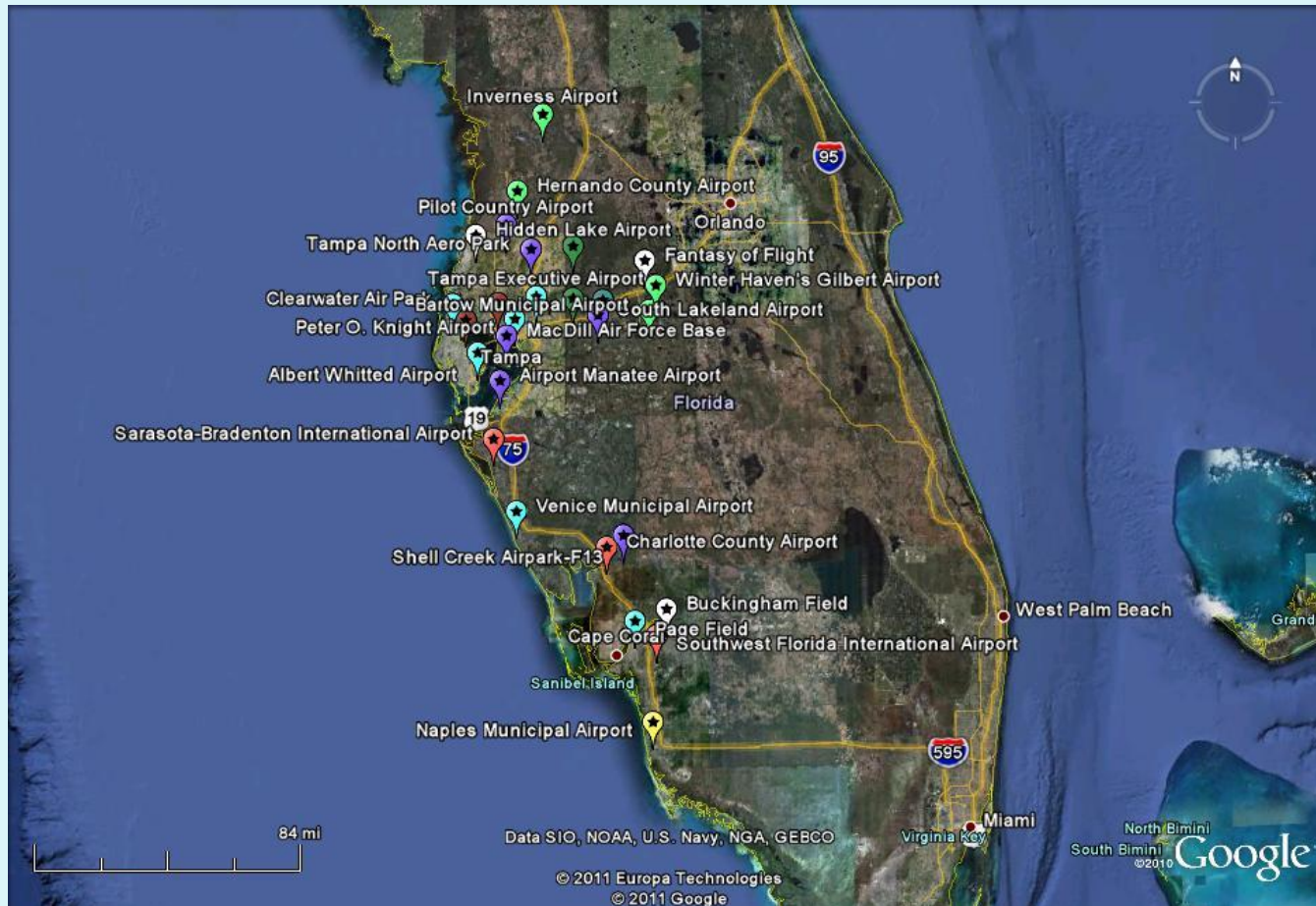
*Fantasy Of Flight - Lakeland

Charlotte County

Buckingham Field (Lehigh Acres) – Ft. Myers



All airports – 10 county area

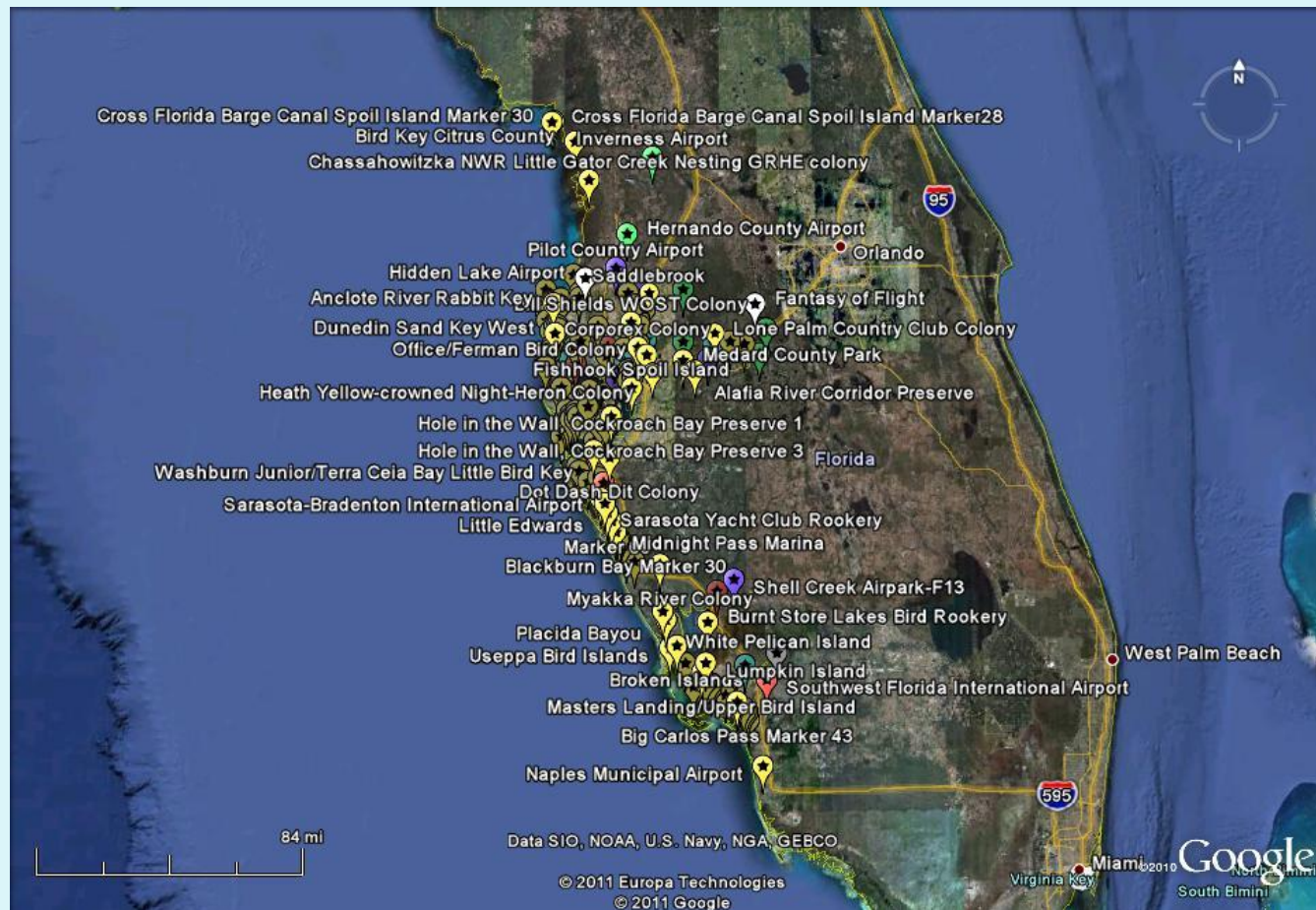


Landscape level assessment

At the landscape level, what is the positional relationship of airports and waterbird colonies, what is the seasonal distribution of the bird population, and what are potential bird movements based on seasonal habitat needs?

Bird distribution and activity varies by species and seasonally - movements are related to species-specific habitat needs and behaviors

All bird colonies and airports – 10 county area



Example - Polk County

5 Airports

Lake Linder

Bartow

South Lakeland

Fantasy of Flight (private museum)

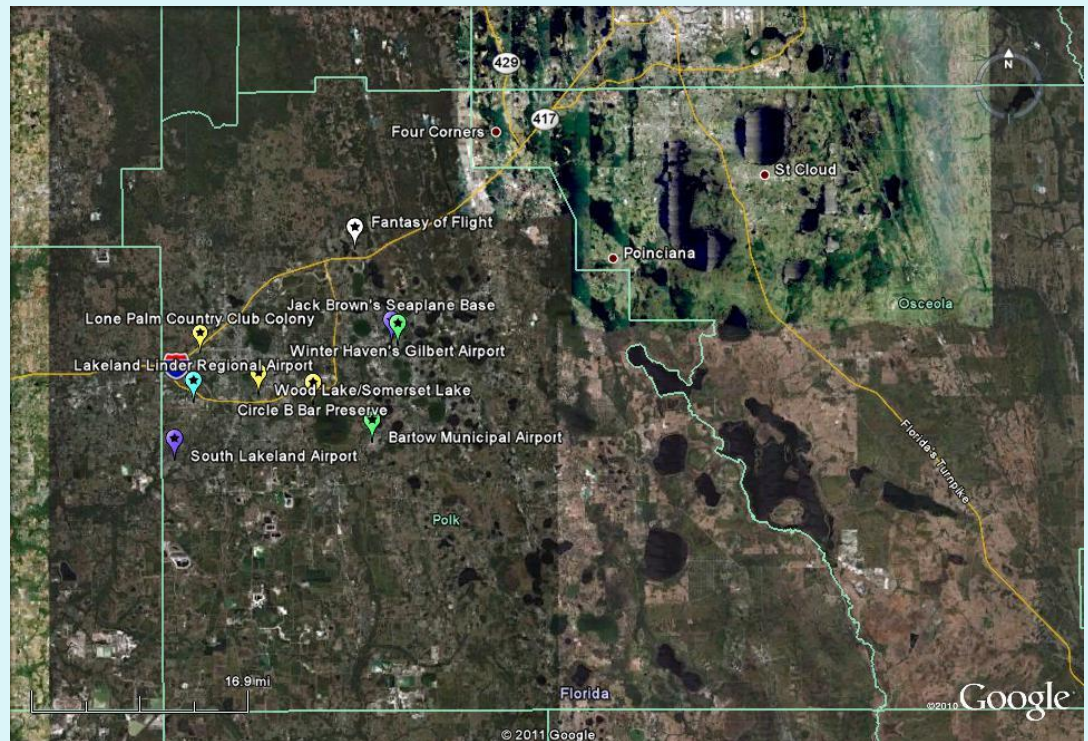
3 Colonies

- Circle B Bar Preserve – small herons and egrets

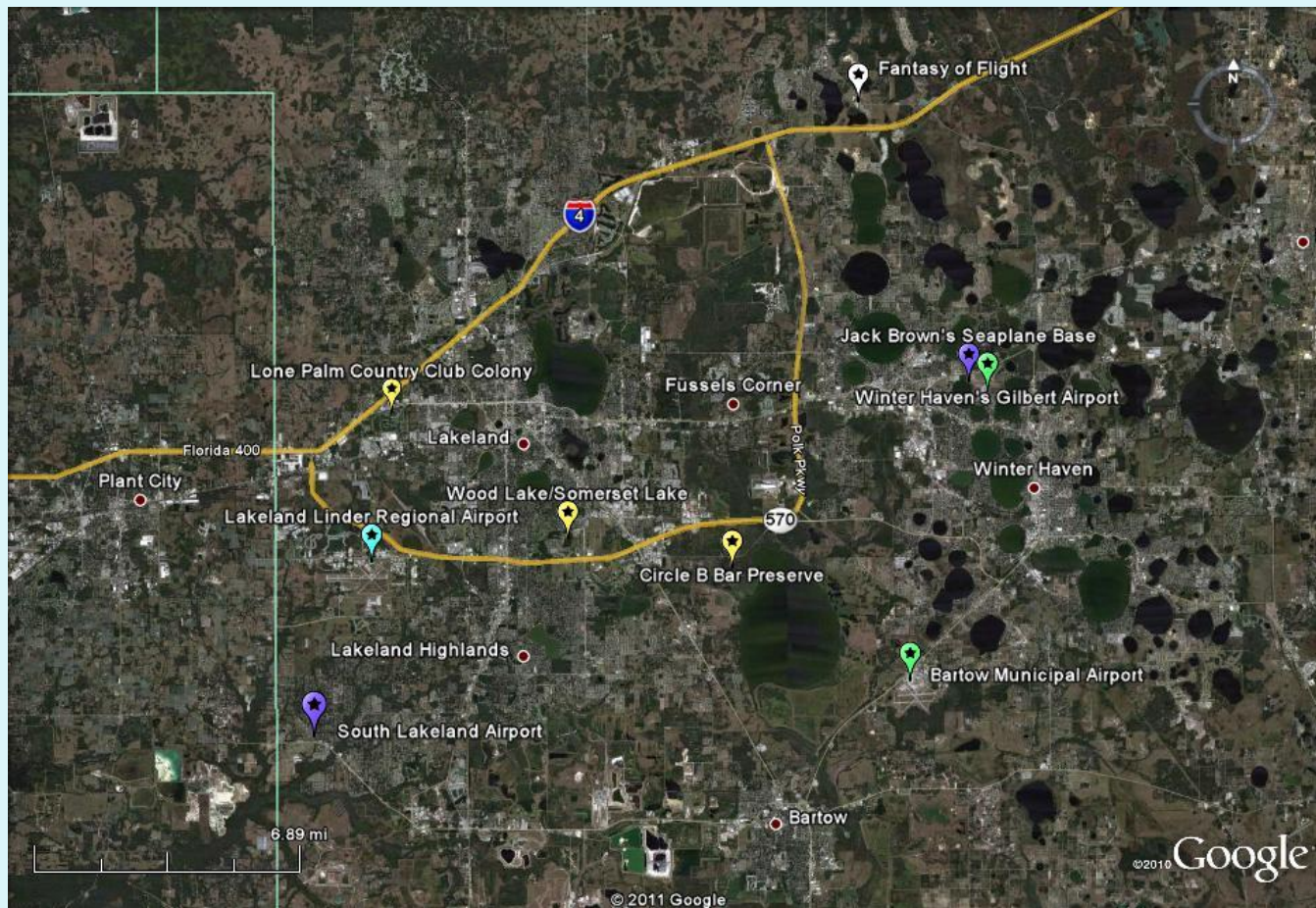
- Lake Somerset

400 wood storks, plus white ibis, small herons and egrets, anhingas, roseate spoonbills, brown pelicans

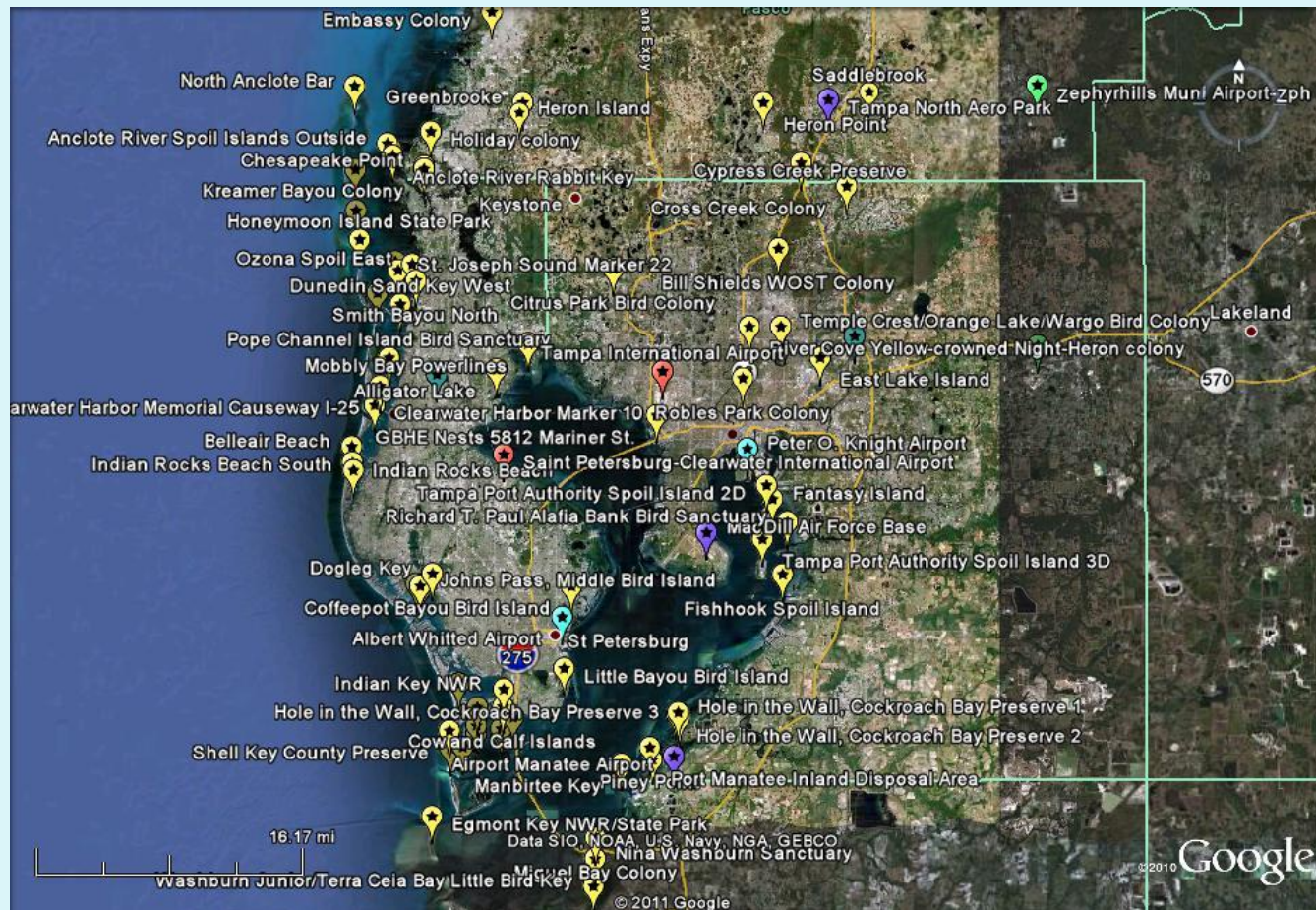
- Lone Palm Country Club – wood storks, small herons and egrets



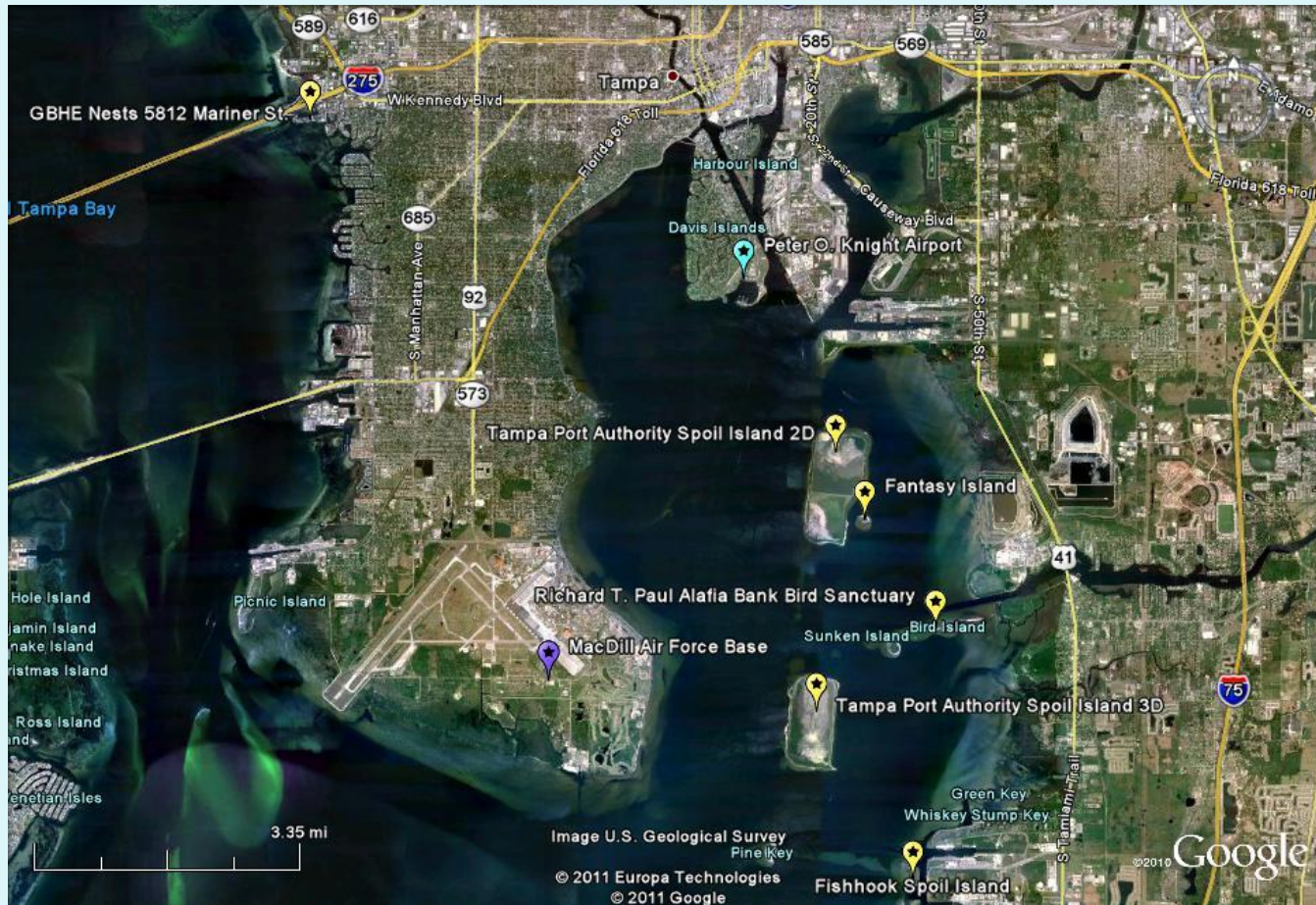
Landscape level relationship of airports and bird colonies in Polk Co.



Tampa Bay area (Hillsborough and Pinellas Counties) has a much denser landscape level bird population



Hillsborough Bay – Alafia Bank Bird Sanctuary is the most important colonial wadingbird colony on the west-central coast – 10,000-15,000 pairs (mixed spp.) annually



Predicting habitat use

Waterbird movements are partially predictable in the landscape context in non-migratory populations, based on the season. Movement is related generally to locating a nest site (colony position), nesting and raising young, and foraging. When the young are in the nest the adults forage and return to their nest and incubating partner. After the young fledge, adults and young disperse until the next nesting season. Then, movements are nomadic, focused on foraging and building body condition for the next nesting cycle.

The type of prey selected may change with the age of the young, prey availability, and the hydrological cycle. Prey bloom occurs with seasonal rains.

The most efficient foraging is in shallow water / shallow ponds where prey is trapped and rapidly acquired. The target is prey, not water.

Natural vs. man-made wetland types – functional equivalents

Natural wetland types

- ❖ Rivers – flowing water in freshwater zone; examples: Hillsborough River, Alafia River
- ❖ Streams - tributaries to rivers, narrow and shallow
- ❖ Lakes – large ponded water bodies
- ❖ Ponds – persistent, small ponded water bodies
- ❖ Prairie ponds – ephemeral, short hydroperiod wetlands
- ❖ Cypress domes – unique, forested wetlands with short hydroperiod to extended flood period

Man-made wetland types

- Old phosphate mines – fingers or islands of unexcavated material left where bird colonies can develop
- Borrow pits – often seen near roadway construction
- Stormwater ponds – industrial, commercial, and residential water retention for stormwater control, some with islands
- Water hazards – ponds on golf courses
- Ditches – linear drainages moving stormwater, replace natural creeks and streams

Commuter Notes

- Colony size varies – a few pairs to 100s to 1,000s
- Species in the colony varies – 1-many
- Flying elevations vary depending on activity – some examples:
 - White pelicans – migrants and over-winter, 4,500-5,000 <10,000 ft AGL when migrating, 800-3,000 ft soaring and moving, looking for forage – schools of fish
 - Wood storks – soar at 800-1,200 ft, single birds at 5,000-6,000 ft
 - Waterbirds – most waders fly low to foraging sites – about 500 ft
 - Passerines – often 5,000-6,000 ft in migration – the Tampa Bay area is a migration funnel
 - Moorhens / coots – poor flyers, commonly flushed from a pond and slowly climbing to 100-200 ft

Study: Roseate spoonbill foraging in the Tampa Bay watershed



- Alafia Bank Bird Sanctuary ~50% of Florida's Roseate Spoonbills;
- Terra Ceia Bay: Washburn & Washburn Jr.;
- Riviera Bay: Coffeepot Bayou Bird Island
- Indian Key NWR
- Clearwater Harbor: I-25
- Foraging: both estuarine and freshwater locations



Ditches provide foraging – replacing natural streams

Cattle Egrets looking for insects

White Ibis digging for invertebrates



Stormwater ponds

**Stormwater ponds without cover
provide little habitat value – no
cover, less forage**

**Shallow vegetated ponds have good
cover at water drawdown, more
forage**



Emergent and floating aquatic plants have high wildlife value

When ponds have a littoral shelf or very gentle shoreline slope they develop emergent plants around the perimeter – here, a stand of cattails (*Typha latifolia*) is thick enough to provide cover for nesting ducks, moorhens, etc.

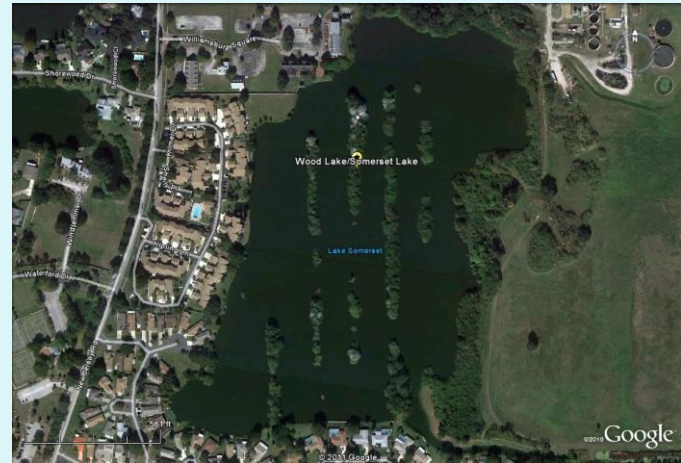


Floating aquatic plants provide invertebrate prey, and *Lemna* has 18% protein content plus aufwuchs



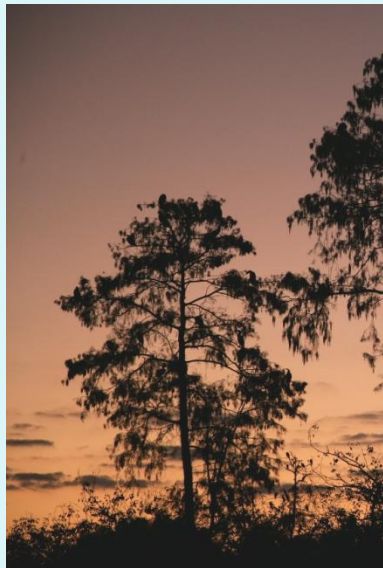
Colony substrate is highly variable

- Cypress Creek ELAPP – island in an old borrow pit – elderberry, red maple, dying cypress, and Carolina willow
- Myakka River wood stork colony on island
- Lake Somerset – unmined fingers in an old phosphate pit



Night Roosts

- About 125 birds roosting 05:45 in trees at Lake Platt
- Birds roost safe from predators high in trees over water
- Wintering roosts when not nesting
- Night roosts may develop into nesting colonies if suitable habitat, no predators, and no disturbance



Summary

- Monitoring of nesting colonies guides timely & appropriate management responses.
- Audubon worked with partners, agency staff, & volunteers to protect nesting habitat for 95+% of the regional waterbird population.
- Long-term data now can be used to respond to regional planning needs, including landscape-level airport safety evaluations.
- Data coupled with remote sensing is a powerful tool.



Program Results



75 Years in Tampa Bay

- Long-term conservation of viable bird populations, institutions that effectively manage and protect local populations, and a public that understands and supports measures needed to secure habitats.

Looking Forward

- Ecosystem conservation initiatives and colony protection directly involves volunteers, agencies, and the public to protect regional bird colonies and habitat for >200,000 colonial waterbirds of 30 species, including 14 listed species.



Florida Coastal Islands Sanctuaries Program

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813-623-6826 Office

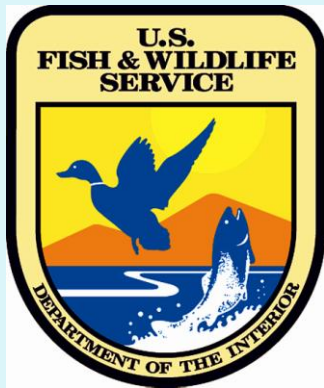
813-623-4086 Fax



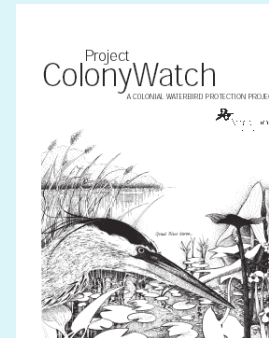
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Thank you to our many partners

- Audubon Chapters



- Southwest Florida Water Management District
- Manatee County Port Authority
- Florida Parks Department



Questions?



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